Competency 1.25 **EH Residents shall demonstrate a working level knowledge of hazard communication (HAZCOM).**

1. Supporting Knowledge and Skills

a. Discuss the goals, actions, and employer requirements specified by the Occupational Safety and Health Administration Hazard Communication Standard.

b. Describe the purpose of a written Hazard Communication Program.

c. Describe the content and use of material safety data sheets (MSDS).

d. Describe the proper labeling requirements for hazardous material. Include the size, location, and content/description.

e. Discuss the content and use of the National Fire Protection Association Diamond for labeling hazardous material.

2. Self-Study Activities (corresponding to the intent of the above competency)

Below are two web sites containing many of the references you may need.

Web Sites		
Organization	**Site Location**	**Notes**
Department of Energy	http://wastenot.inel.gov/cted/stdguido.html	DOE Standards, Guides, and Orders
OSHA	http://www.osha-slc.gov/	OSHA documents and search engine
U.S. House of Representatives	http://law.house.gov/cfr.htm	Searchable Code of Federal Regulations

Read 29 CFR 1910.1200 (e), Written hazard communication program.

EXERCISE 1.25-A Referring to 29 CFR 1910.1200, what are the purpose and general requirements of OSHA's hazard communication program?

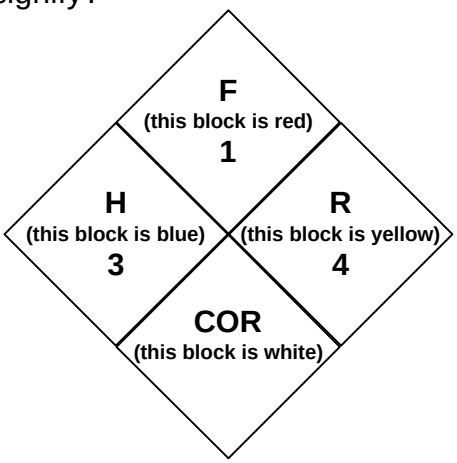
EXERCISE 1.25-B Referring to 29 CFR 1910.1200 (e), what are the purpose and general elements of an employer's written hazard communication program?

EXERCISE 1.25-C Locate and scan the material safety data sheets (MSDSs) maintained at each of the buildings or areas in which you perform your job duties. Identify the person responsible for keeping the book/file of MSDSs current. Report your findings to your supervisor.

EXERCISE 1.25-D Referring to 29 CFR 1910.1200, list and describe the sections of the material safety data sheet (MSDS)?

Read the summary section of this guide.

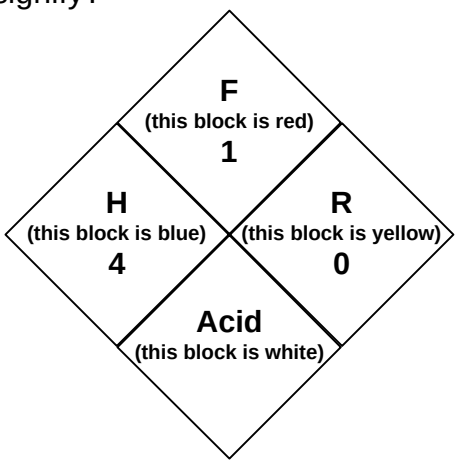
EXERCISE 1.25-E For the square containing the "R" in the following hazardous material classification sign, what do the letter and number signify?



Hazardous Material Classification

A. Radioactivity Hazard, unstable
B. Radioactivity Hazard, slightly hazardous
C. Reactivity Hazard, unstable
D. Reactivity Hazard, may detonate

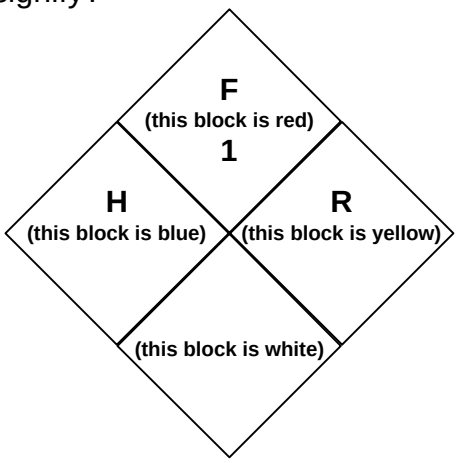
EXERCISE 1.25-F For the square containing the "H" in the following hazardous material classification sign, what do the letter and number signify?



Hazardous Material Classification

A. Health Hazard, normal
B. Health Hazard, slightly hazardous
C. Health Hazard, extremely hazardous
D. Health Hazard, deadly

EXERCISE 1.25-G For the square containing the "F" in the following hazardous material classification sign, what do the letter and number signify?



Hazardous Material Classification

A. Fire Hazard, will not burn
B. Fire Hazard, flashpoint above 220° F
C. Fission Hazard, category 1
D. Fission Hazard, criticality 1

3. Summary

MSDSs and warning labels provide guidance for working with hazardous materials. MSDSs are technical bulletins that contain specific chemical product information about the hazardous chemicals in the workplace. The MSDSs must be stored in a place accessible to the actual work area where employees may freely read or copy them. MSDSs are prepared by the manufacturer of the hazardous material and are supplied along with the procured material.

The chemical manufacturer, importer, or distributor must label each hazardous chemical container in accordance with OSHA regulations. Hazardous materials prepared for shipment must be labeled in accordance with Department of Transportation (DOT) regulations. Hazardous waste must be labeled in accordance with Environmental Protection Agency (EPA) regulations. Facilities that store or use hazardous products should have National Fire Protection Association (NFPA) warning signs.

OSHA warning labels are useful for identifying information about chemical hazards. Warning labels must the name of the chemical material that matches the name on the MSDS and all appropriate hazard warnings. Warning labels must be attached to bags, barrels, bottles, boxes, cans, cylinders, drums, reaction vessels, storage tanks, and all other chemical containers. A transfer container need not be labeled if only one person is to handle the container and the container is filled and emptied in the same work shift.

The NFPA 704 System of Hazard Identification is used to warn firefighters and emergency personnel of hazards' dangers. The NFPA 704 diamond symbol presents information on health, flammability, and reactivity hazards, as well as special hazards associated with the chemical. The numbers from 0 through 4 are placed in the three upper squares of the diamond to show the degree of hazard present for each of the three hazards (health displayed in blue, flammable in red, and reactive in yellow). Zero indicates no hazard, and four, the highest hazard. The fourth square at the bottom is used for special hazards such as oxidizer, radioactive, or to avoid the use of water. The categories for each of the hazards are:

<u>Health</u>

4 Too dangerous to enter vapor or liquid
3 Extremely dangerous - use full protective clothing
2 Hazardous - use breathing apparatus
1 Slightly hazardous
0 Like ordinary material

Flammable

4 Extremely flammable
3 Ignites at normal temperatures
2 Ignites when moderately heated
1 Must be preheated to burn
0 Will not burn

Reactive

4 May detonate - vacate area if materials are exposed to fire
3 Strong shock or heat may detonate - use monitors from behind explosion-resistant barriers
2 Violent chemical change possible - use hose streams from distance
1 Unstable if heated - use normal precautions
0 Normally stable

4. Exercise Solutions

EXERCISE 1.25-A Referring to 29 CFR 1910.1200, what are the purpose and general requirements of OSHA's hazard communication program?

ANSWER 1.25-A Purpose: To ensure that all the hazards of all chemicals produced or imported are evaluated, and that information concerning their hazards is transmitted to employers and employees.

Requirements:
1. Hazard determination
2. Written hazard communication program
3. Labels and other forms of warning
4. A material safety data sheet (MSDS) for each hazardous chemical
5. Employee information and training
6. Trade secrets

EXERCISE 1.25-B Referring to 29 CFR 1910.1200 (e), what are the purpose and general elements of an employer's written hazard communication program?

ANSWER 1.25-B Purpose: To inform and provide specific information for employees about hazardous materials in the workplace.

Elements:
1. a list of the hazardous chemicals known to be present
2. the labeling of all hazardous chemical containers
3. a material safety data sheet (MSDS) for each hazardous chemical
4. employee information and training

EXERCISE 1.25-C Locate and scan the material safety data sheets (MSDSs) maintained at each of the buildings or areas in which you perform your job duties. Identify the person responsible for keeping the book/file of MSDSs current. Report your findings to your supervisor.

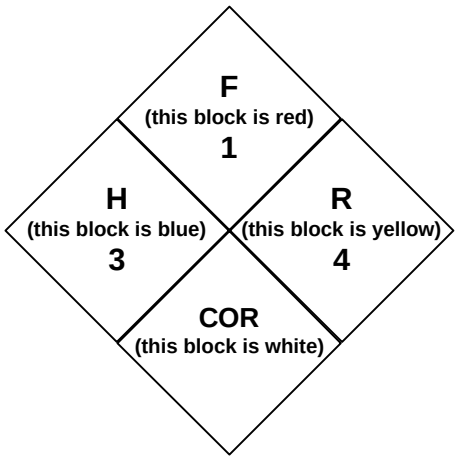
ANSWER 1.25-C None required.

EXERCISE 1.25-D Referring to 29 CFR 1910.1200, list and describe the sections of the material safety data sheet (MSDS)?

ANSWER 1.25-D
1. Background information on the material - includes the product name/synonyms, manufacturer name and address, and the date of MSDS preparation. Also in this section are two telephone numbers: one is for use when there is an emergency situation involving the material, and the other is for obtaining additional information such as technical data.
2. Hazardous ingredients and identity information - chemical products are often mixtures of several ingredients, and the MSDS must identify all hazardous ingredients that are contained in the mixture. This section is required to list the chemical and common name of each ingredient, specify the OSHA permissible exposure limit (PEL), and specify the American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit value (TLV). The relative makeup by percentage of the individual items in the product is optional in this section.
3. Physical and chemical properties - includes physical and chemical properties such as boiling point, melting point, density, vapor pressure, specific gravity, water-solubility, and general appearance and odor. Such data indicate the physical state of the substance and its reaction under certain circumstances.

4. Fire and explosion hazard data - lists special fire or explosion hazards associated with the materials. It also includes fire fighting procedures such as the best fire extinguishing and personal protective equipment. This section identifies the flash point of the material in order to indicate the minimum temperature at which the substance will give off sufficient vapor to support combustion. Also included is the amount of gas/vapor of the substance, by volume in air, that will explode or burn if ignited.
5. Reactivity data - indicates the stability of the chemical and identifies incompatible materials and conditions to avoid. Hazardous decomposition by-products are listed only if the material is at risk of decomposition. If a chemical has a tendency to polymerize, any associated hazards are also listed in this section. Polymerization is the process by which chemicals self-react and combine to form larger molecules.
6. Health hazard data - includes a list of overexposure indicators and routes of entry. This section also lists exiting medical conditions that are aggravated by exposure to the material. For each route of entry there must be a list of immediate (acute) health effects, delayed (chronic) health effects, emergency and first-aid procedures, and exposure limits (for airborne hazards).
7. Precautions for safe handling and use - involves instructions for storage, containment, recovery, and disposal. The handling and storage portion may provide information such as temperature ranges, humidity ranges, and other climatic information. Special requirements for transportation should also be listed here.
8. Control measures - details control measures, especially personal protective equipment. Included here are appropriate cartridges for respirators, specific materials for gloves and protective clothing, and necessary eye and face protection. The level of ventilation required is also listed.

EXERCISE 1.25-E For the square containing the "R" in the following hazardous material classification sign, what do the letter and number signify?

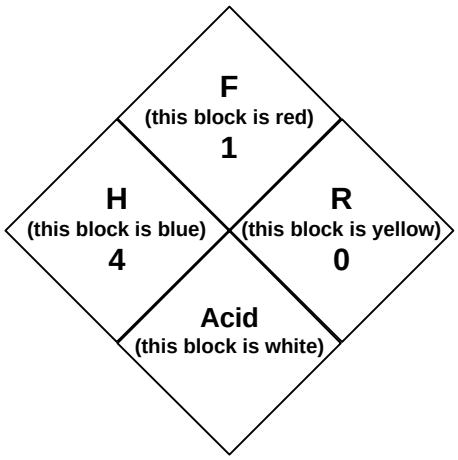


Hazardous Material Classification

A. Radioactivity Hazard, unstable
B. Radioactivity Hazard, slightly hazardous
C. Reactivity Hazard, unstable
D. Reactivity Hazard, may detonate

ANSWER 1.25-E D. Reactivity Hazard, may detonate. Evacuate area if materials are involved in fire.

EXERCISE 1.25-F For the square containing the "H" in the following hazardous material classification sign, what do the letter and number signify?



Hazardous Material Classification

A. Health Hazard, normal
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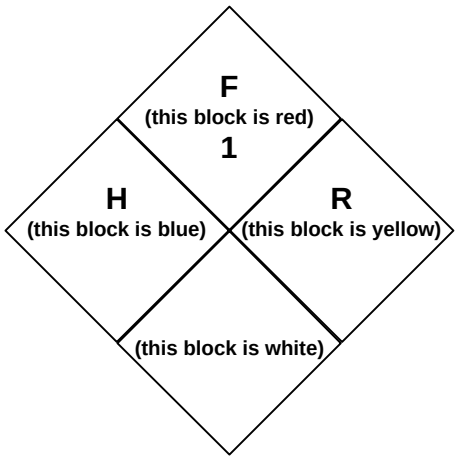
C. Health Hazard, extremely hazardous
D. Health Hazard, deadly

ANSWER 1.25-F D. Health Hazard, deadly

EXERCISE 1.25-G For the square containing the "F" in the following hazardous material classification sign, what do the letter and number signify?



Hazardous Material Classification

A. Fire Hazard, will not burn
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ANSWER 1.25-G B. Fire Hazard, flashpoint above 220° F